

SELF-CONCEPT, SELF-EFFICACY, AND ICT LITERACY LEVEL AS STUDENTS' MOTIVATORS TOWARDS THE USE OF DIGITAL -TECHNOLOGY

By

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ABSTRACT

The study investigated the interactive and relative effects of self-concept, self-efficacy and ICT literacy level on students' motivation towards the use of digital technology. The study sample comprised 1216 participants drawn from three universities in Ogun State, Nigeria. Four valid instruments were used in collecting data. Multiple regression analysis was utilized to analyse the data. The results indicated that the independent variable combined to predict 57.4% of students' motivation towards the use of digital technology. Self-concept was not a good predictor of students' motivation towards the use of digital technology. However self-efficacy and ICT literacy level contributed significantly to the prediction of students' motivation towards the use of digital technology with ICT literacy level making higher contribution to the prediction of the dependent variable. In view of this finding, it was suggested that developing the students' ICT literacy and self-efficacy would improve students urge towards the use of digital technology that is expedient for academic excellence.

Keywords: Self-concept, Self-efficacy, ICT literacy, Digital-Technology

INTRODUCTION

Human race is currently living in the age of knowledge explosion in view of the proliferation and the influence of the new technologies in almost all human endeavours such as space exploration, education, engineering, banking, medicine, communication, commerce, etc. Tella, Tella, Ayeni and Ogie (2007) observe that digital technology (DT) is becoming prominent in the drive for academic excellence in the educational setting. Digital technology can be described as hardware that deliver information, that serve as tools to accomplish a task (Wanyu, 2003). Throwing more light on the meaning of DT, Special Schools and Academics Trust (2007) and Wikipedia (2007) explain that digital technology are technologies or electronic systems that use digital signals for compression of communication, faster and easier transmission of information. DT makes use of discrete values (often electrical voltages), representing numbers or non-numeric symbols such as letters or icons for input, processing, transmission, storage or display.

Since the time digital technology has found its way into educational system, it has engendered more constructivist approaches to teaching, and to improve

overall students' motivation to learn. The digital technology that the students use for personal and academic purposes include the Internet, CD-Rom databases, computers, projectors, multimedia, electronic bulletin boards, digital calculators, telephone, telex, electronic books, DVD, etc. Through the use of these DTs, students and teachers gain access to information beyond quality and quantity available in prints. Increased availability of digital technologies have opened the way to varied educational opportunities including tracking and easy storage of information, online education, and enhancement of qualitative teaching and learning. In the opinion of Tella, Tello, Ayeni and Ogie (2007), students with greater academic aspirations make investments into their future by exploring the digital environment. The maximum exploration of such environment is dependent on the interplay of student's full commitment and some motivational personality constructs.

Cassidy and Eachus (n.d.) and Robert (2002) lamented that in spite of the numerous influential potentials of digital technology in education sector, many students do not have the power to control the potentials due to their limited ability to take the power. Advancing reason for this

deficiency, Cassidy, Eachus and Robert noted that such students lack motivational factors. Motivational factors captivate the individual's ability to successfully accomplish academic task because the concept of motivation is a major component of learning in any educational environment (Machr, 1984; Schunk & Pajares, 2001). The basis for which students get engaged in, pursue, successfully accomplish certain tasks and why they avoid some tasks as noted by Mitidaou (1999) emerge from motivational constructs such as self-concept and self efficacy. Tuckman and Sexton (1992) equally observe that students' possession of the necessary skills to do what he is expected is a great motivator that keeps him focused on what to do in order to achieve success. From the afore-mentioned, it can be deduced that students' frequent usage of DT may be anchored on or determined by self concept, self-efficacy and the level of ICT literacy.

Self-concept (SC) as perceived by Christopher and Scott (2005) play important roles in the students' disposition towards accomplishing a task. Pajares and Schunk (2001) describe self-concept (SC) as the cognitive appraisal of the expectations, descriptions and prescriptions one holds about oneself. In other words, it is the person's view of himself as conceived and organized from his inner vantage. Tella, Tella, Ayeni and Ogie (2007) regarded individual's negative SC as social indictment that results to academic failure. It therefore follows that students with higher sense of personal technology competence tend to approach difficult tasks in the use of technological devices as challenges that must be tackled to success.

Self-efficacy (SE) is another construct, whose contribution as a motivational factor towards students' use of DT was also investigated in this study. Saks (1995) defined self-efficacy as the judgement of an individual that makes his capability to successfully perform specific tasks and behaviour. According to Bandura (1999), SE is the belief in one's capability to organize and execute the course of action required to manage prospective situations. Meanwhile, the level of one's self-efficacy in a task through interaction and cognition is more or less a contributing factor to the level of performance in such a

task. As a matter of fact, Gist (1989) and Gist and Mitchell (1992) further explain that the choice of the task to embark upon, accomplish and efforts expended by individual to accomplish such tasks are influenced by one's self-efficacy. Higher level of SE would make an individual to feel competent, confident and motivated to engage in a chosen or given task. Similarly, the perception of students about their self-beliefs in computer technologies usage (computer or technology self-efficacy) is very significant to advance DT use.

Digital technology self-efficacy according to Yusuf (2005) and Dillan, Lending, Crews and Blackenship (2003) is positively correlated with the willingness to choose to participate in computer technologies related activities, expect success and persevere when confronted with difficulties and the level of performance in the use of the digital technologies or computer technologies. It is suffice to state that students who have little or no confidence in their ability to use digital technology could be said to have weak technology - self efficacy beliefs. Such students are less motivated to attempt and execute tasks and activities using computer or digital technologies. Whereas, students who assume themselves as being capable of using digital technology are regarded as having high self-efficacy beliefs and are more motivated to attempt and accomplish tasks using digital technologies. It is worth noting that the issue of SE should not be confused with the level of skill acquisition, rather it is related to the judgement of what one can do with whatever skill one possesses.

Researchers on self efficacy revealed that SE contributes in increasing an effective performance of a task (Schunk, 1994); a tool to overcome fear of using the computers (Matthews & Robert, 2000); influences students' attitude towards the use of technological devices for academic achievement (Barry, Albert & Maniel, 1992); promotes performances and reduces anxiety (Compeau & Higgins, 1995); contributes to one's level of desire to use electronic devices (Waldman, 2003); and determine's students' frequency of library electronic resources use.

Though the advent of new technologies has provided opportunities to expand learning options, still students

seem to have a slow uptake of the computing and communication technology due to anxiety, computer-phobia and lack of confidence to use these evolving technologies for the purpose of learning. The bane of these problems is not unconnected with the little or low level of students' literacy in Information and Communication Technology (ICT). For instance, in view of the huge benefits derived from the use of computer technologies within education system, many schools in US were equipped with computers, with a student computer ratio 10:1. In spite of this effort, Peter (2001) found out that many students claimed never to have used computer for school work because they lack the required ICT literacy.

Meritt, Smith and Di Renzo (2005) reported that there is a relationship between ICT literacy level and scholastic performance. ICT literacy according to Owen (1996) is the level of knowledge and understanding of computer related technologies to accomplish any given task. Zeszutarski (2000) further described ICT literacy to include the ability to use e-mail, graphical interface such as Netscape, online publishing and the ability to evaluate the content of the materials. Studies have established that students' utilization of the new technologies enhances collaborative grouping, holistic and integrated learning (Dellit, 2002); improves the quality of education (Gusen, Olarinaye & Garba, 2004); enhances students' academic performance (Day & Bartle, 1998); and facilitates intellectual growth and advance experiences (Nayfeh, 1998).

Generally, educationists are beginning to realize the rapid changes in educational system as a result of the influence of progressive technological development. They are getting to understand that various factors could spark students' positive attitude towards the use of technological devices for learning and other purposes. Considerable researches have focused on the relationship between students' use of computer technologies and some factors such as self-concept and self efficacy. Meanwhile, there seems to be a dearth of studies on the combination of student's level of ICT literacy with the former motivational factors to predict students' usage of digital technology.

Research Hypotheses

The following are hypothesized for this study:

Hypothesis 1

Self Concept, Self-efficacy and students' ICT level literacy will not combine significantly to predict students' motivation towards the use of digital technologies.

Hypothesis 2

Self Concept, Self-efficacy and ICT literacy will not relatively predict students' motivation towards the use of digital technologies.

Methodology

Design

This study adopted a descriptive survey research approach to find out the prediction of the respondents' motivation towards the use of digital technologies through self-concept, self-efficacy and ICT literacy.

Sample

The sample of this study comprised of 1216 undergraduate students who were randomly selected from University of Agriculture, Abeokuta, Ogun State, Nigeria, Tai Solarin University of Education, Ijebu-Ode, Ogun State, Nigeria and Olabisi Onabanja University, Ago Iwoye, Ogun State, Nigeria.

Instruments

The researcher in collecting data for this study used four instruments. The instruments are, Self-Concept Conduct Inventory (SCCI), General Perceived Self-efficacy Scale (GPSS), Students' ICT Literacy Scale (SILS), and Digital Technology Use Scale (DTUS).

(a) Self-Concept Conduct Inventory (SCCI)

This instrument was developed by Akinbaye (1986). The instrument has 30 items tapping the appraisal of the academic, social and personality traits in individual self. Participants respond by indicating their level of agreement to each of the items using a five-point scale ranging from 1 (Never like me) to 5 (Always like me). The scale has a test-retest reliability coefficient of 0.78.

(b) General Perceived Self-Efficacy Scale (GPSS)

This scale was developed by Schwarzer and Jerusalem

(1995) to assess self-efficacy based on personality disposition. The instrument had 10 items rated on four point scale of 1(Not at all true), 2 (Barely true), 3 (Moderately true) and 4 (Exactly true). Respondents indicated their extent of agreement to each of the statements. The scale has a high internal consistency with Cronbach & alpha between 0.75 and 0.90 (Schwarzer and Jerusalem, 1995).

(c) Students' ICT Literacy Scale (SILS)

This instrument was self-designed by the researcher. It was used to collect data on the respondents' level of computer literacy. The instrument has two sections. Section I elicited information on the demographic data of the respondents. Section II contained 39 items with which students were asked to rate themselves on their level of computer handling operations on the five-point scale of Very Good (5 points), Good (4 points), Fair (3 points), Poor (2 points), Very Poor (1 point). The computer operations included file management, word processing, graphics, spreadsheet, power point presentation and desktop publishing applications. The instrument was given to computer science lecturers and a psychometrician for scrutiny. The alpha reliability of the instrument yielded 0.91.

(d) Digital Technology Use Scale (DTUS).

This instrument was used to collect data on the students' frequency of digital technologies use. DTUS has two sections. Section A required the respondents' agreement or disagreement with the 11 item statements dictating their frequency of the use of digital technologies. The statements were rated on five-point scale of Very Good (5), Good (4), Fair (3), Poor (2), Very Poor (1). Section B of the instrument asked for the students' frequency of digital technology use and the type of digital technology used. The validity of these items was ensured through proper scrutiny and expert advice of the psychometricians, and experts in test items construction. The test- retest reliability of the instrument was 0.89.

Procedure for data collection

The four instruments were administered to all the respondents who took part in the study. The instruments

were administered to the participants by the researcher and six research assistants. Some of the instruments were collected immediately after completion while the rest were collected some days later.

Data Analysis

The data collected were analyzed with the Multiple Regression statistical tool. The Multiple regression was used to find the combined and relative contributions of the independent variables (self concept, self efficacy and ICT literacy level) to the prediction of the dependent variable.

Results

The results of the analysis are presented below:

Hypothesis 1

Self Concept, Self-efficacy and student's ICT literacy level will not combine significantly to predict students' motivation towards the use of digital technologies.

a. Predictors: (constant), ICT literacy, self efficacy, self concept

b. Dependent variable: motivation towards digital technology usage

Going by the results presented in Table 1, the three independent variables (Self Concept, Self-efficacy and ICT literacy) made a joint contribution of 57.4% in motivating students towards the use of digital technologies. The results of the analysis of variance (ANOVA) that was done on multiple regression data produced an F-ratio 547.469 of which was significant at 0.05 Alpha level. By implication, the independent variables are good fit for the prediction of the dependent variable.

Table 2 shows that the two variables contributed to the prediction of the students' motivation towards the use of

Source	df	Sum of square	Mean of square	F-Ratio	P
Regression	122998.47	3	40999.490	547.469	< .05
Residual	90765.668	1212	74.889		
Total	213764.14	1215			
R-Square = .575					
Adjusted R-Square = .574					
Standard Error of the estimate = 8.65385					

a. Predictors: (constant), ICT literacy, self efficacy, self concept

b. Dependent variable: motivation towards digital technology usage

Table 1. Summary of the Regression analysis of the predictor variables and the outcome measure.

Source	R	R-square	Adjusted R-square	Std. Error of the Est.	df	R-square change	p
ICT literacy	.757	.573	.572	8.67387	1214	.573	< .05
Self Efficacy	.759	.575	.575	8.65065	1213	.003	< .05

Table 2. Summary of the Stepwise Regression Analysis of the Predictor Variables and the outcome Measure.

Source	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	β	Std Error	β		
(Constant)	21.596	1.897		11.384	.000
Self concept	.003	.011	.006	.319	.750
Self efficacy	-.143	.053	-.053	-2.698	.007
ICT literacy	.267	.007	.760	40.064	.000

Table 3. Relative contributions of independent variables to students' motivation towards the use of digital technologies.

digital technologies. Meanwhile, ICT literacy ($R^2 = .573$, R^2 change = .573, $p = < .05$) had made a strong prediction of the dependent variable while self efficacy ($R^2 = .575$, R^2 change = .003, $p = < .05$) made a little contribution to the prediction of the dependent variable.

Hypothesis 2

Self Concept, Self-efficacy and students' ICT literacy level will not relatively predict students' motivation towards the use of digital technologies.

The results in Table 3 show that ICT literacy (Beta = .267, $t = 40.064$, $P = < .05$) was the major or potent predictor of students' motivation towards the use of digital technologies while self efficacy (Beta = .143, $t = -2.698$, $P = < .05$) also made a significant contribution to the prediction of the dependent variable. Meanwhile, Self - Concept (Beta = .003, $t = .319$, $P = < .05$) made the least but significant contribution to the prediction of students' motivation towards the use of digital technologies.

Discussion

The results of Tables 1 and 2 reveal that self- concept, self-efficacy and students' ICT literacy level jointly predict and contribute significantly to motivate students towards the use of digital technology. As shown in the Adjusted R-squared (0.574) in Table 1, 57.4% of the total variance of the students' motivation towards the use digital technologies is a result of the combined contribution of self-concept, self-efficacy and students' ICT level. Similarly, the F-ratio of 547.469, which is significant at .05 Alpha level is a further confirmation of the fact that the predictive power of the independent variables was not a

matter of chance. This corroborates the findings of Pajares and Johnson (1996) and Skadlvik and Rankin (1996) that self-efficacy and self-concept predict the performance of individuals. On the prediction of students' use of digital technologies by ICT literacy and self-efficacy, Johnson, Ferguson and Lester (2001) revealed that there is a relationship between students' computer literacy level and their self efficacy beliefs. To these researchers, students' ICT literacy level and self-efficacy are good boosters of students' confidence in their abilities in computer applications, use of Internet and electronic mail.

The results in Table 2 revealed that students' ICT literacy level showed a significant prediction of students' use of digital technology because of its 57.3% contribution. Meanwhile, when self-efficacy was entered as the second variable, a significant contribution of 0.3% was added to the prediction of students' motivation towards the use of digital technology. This outcome is of variance with the findings of Tella and Tello (2003), Pajares and Graham (1999), and Pajares & Johnson (1996) that self efficacy is a better predictor of academic performance.

The results of the second hypothesis which tends to find out the relative significant contribution of each of the three independent variables to the prediction as shown in Table 3 revealed that students' ICT literacy level is the best predictor of students' urge towards using digital technologies. This is not surprising because, naturally knowledge, idea, skill possession and mastery in the use of computer technologies (digital technologies) are what constitute ICT literacy level. And all these are primarily essential to develop confidence in one's ability to use electronic or digital technology. Lending support to this outcome, Harrison and Rainer (1992) and Hill, Smith and Mann (1987) found that students with higher level of ICT literacy possess a higher level of computer self-efficacy.

This study further reveals that self efficacy beliefs has a greater potential of predicting students' use of digital technology. Similarly, Ren (2000) found that students with higher self-efficacy frequently use electronic resources in the library. Tella, Tella, Ayeni and Ogie (2007) reported that higher self-efficacy predicts students' use of electronic

information which made them to perform better than those with low self efficacy. Corington (1992), Pintrich (1989), Pintrich and DeGroot (1990), Pintrich and Garcia (1991), Schunk (1991) and Yukman and Sextan (1992) allude to the point that higher level of self-efficacy is not unconnected to higher level of performance and task engagement, thus this motivates students towards the use of computer facilities.

Meanwhile, that self-efficacy as revealed by this study has a greater power over self-concept to predict the independent variable. It could be borne of the high degree of self-efficacy, which acts as a catalyst to human accomplishment and success in life because such person is often positively disposed to a visioned task despite of the hurdles. This is in line with the reports of Chranaki and Vekiri (2007), Karsten and Rath (1998) and Compeau and Higgins (1995) that self-efficacy affects students' attitude towards learning and use of computer facilities. And that individuals with high self-efficacy easily deal with and overcome problems during the course of using computer facilities. Ren (2003) sums it up by asserting that people are generally interested in engaging activities in which they have high self-efficacy.

It is shown from the results of this study in Table 3 that students' self-concept contributed insignificantly to predict their use of digital technology. This points to the fact that students with high level of ICT literacy and high self-efficacy but with low self concept may be motivated towards using digital technologies. By implication, this means that the way a student mirrors himself has no relevance to his usage of digital or electronic technology. This outcome is contrary to the report of Bates and Khasawneh (2007) that students' self-concept has a relationship with his attitude towards the use of online learning systems.

Conclusion and Recommendations

It is evident from the present study that two out of the three independent variables (self-efficacy and students' ICT level) are predominant motivators of students towards the use of digital technology. In view of the fact that we are now in the age of technological advancement and

information explosion, the use of digital technologies by students become more and more expedient in order to increase their knowledge level qualitatively and quantitatively, and possibly increase their academic excellence. As a matter of fact, undergraduates and graduates who are versatile in the use of digital technologies take more advantage and are more comfortable in academic setting.

In the light of the emerging issues in this study, it would be needful to make some recommendations that may help to improve students' motivation towards the use of digital technologies. Students should be enlightened about the fact that achieving success in human endeavours may be difficult without one's ability to effectively interact with the digital technologies.

Students, beginning from secondary school level should be exposed to experiences that are necessary to develop skills in electronic technology usage. School teachers should from time to time expose students to practical assignments that would warrant students' interaction with electronic or digital technology devices. In order to enhance students' self efficacy and probably reduce anxiety and phobia for technology, teachers and lecturers should adapt instructional pedagogy that would be technology driven. Training, guidance and technological assistance in the effective use of digital or electronic resources should be provided for students so as to increase their self-efficacy and ICT literacy level. Through appropriate counsels provided by the teachers/instructors or lecturers, students should be encouraged to construct and form positive opinions about themselves, as well as have confidence in their abilities to successfully tackle any academic challenges.

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